Amendments to the Claims

Listing of Claims:

Original Claims 1-20 (canceled).

Claim 21 (new). An output unit for outputting a signal to a transmission channel having a first bus line and a second bus line of a motor vehicle, the output unit comprising:

a fault-tolerant coding unit for receiving and converting a sensor signal into outgoing transmission signals TxA and TxB;

at least two high-speed driver modules connected antiparallel to one another and downstream from said coding unit for connecting the output unit to the transmission channel and for converting the outgoing transmission signals TxA and TxB into the signal to be emitted; and

a comparison unit performing a voltage comparison of the outgoing transmission signals TxA and TxB with incoming receive signals RxA and RxB, said comparison unit connected to said coding unit;

said coding unit operating under and programmed with a first coding rule for a normal operating mode if equivalence between voltages of TxA and RxA and/or of TxB and RxB is detected by said comparison unit;

said coding unit operating under and programmed with a second coding rule for a special operating mode in an event of inequivalence being detected by said comparison unit between the voltages of TxA and RxA and/or of TxB and RxB, and therefore in an event of one of the bus lines being externally short-circuited to ground or to a vehicle battery;

the first and second coding rules for the outgoing transmission signals TxA and TxB provide a first character set of at least n+1 characters if a second character set for the sensor signal has n characters.

Claim 22 (new). The output unit according to claim 21, wherein each of the characters of both the first and second character sets is represented by a discrete, electrical signal state, and, in an event of an external short circuit being detected in the transmission channel, a voltage of a low or high logic character about to be transmitted as a respective one of said outgoing transmission signals can be changed.

Claim 23 (new). The output unit according to claim 21, wherein the second character set for the sensor signal has at least two different characters and the first character set for the outgoing transmission signals TxA, TxB, the incoming receive signals RxA and RxB, and the signal to be emitted, has at least three different characters.

Claim 24 (new). The output unit according to claim 21, wherein an external short circuit in the transmission channel is detected at a latest after half of a signal time unit has elapsed.

Claim 25 (new). The output unit according to claim 21, wherein a detection of an external short circuit causes the characters of the first character set having a logic low or a logic high to be changed such that a character of the first character set about to be transmitted can be switched to a different polarity at a point between 30% and 70% of a signal time unit has elapsed.

Claim 26 (new). The output unit according to claim 21, wherein the second coding rule is formed such that:

in an event of an external short-circuiting of the second bus line to the ground, a low logic character about to be transmitted in the transmission signal is converted into a

high logic character with time condition;

in the event of the external short-circuiting of the second bus line to the vehicle battery, a high logic character about to be transmitted in the transmission signal is converted into a low logic character with time condition;

in the event of the external short-circuiting of the first bus line to the ground, a high logic character about to be transmitted in the transmission signal is converted into a low logic character with time condition;

in the event of the external short-circuiting of the first bus line to the vehicle battery, a low logic character about to be transmitted in the transmission signal is converted into a high logic character with time condition; and

a recessive ZERO character is transmitted as a ZERO character in each of the aforementioned short-circuit cases.

Claim 27 (new). The output unit according to claim 21, wherein at least the first coding rule provides, for a signal time unit of the sensor signal that is occupied with a character, a signal time unit with a same duration in the transmission signal, the receive signal, and the signal to be emitted.

Claim 28 (new). The output unit according to claim 21, wherein the first and second coding rules provide different characters for two consecutive signal time units in the transmission signal.

Claim 29 (new). The output unit according to claim 21, wherein the first coding rule is formed such that:

a "0" character in the sensor signal is always coded as a low logic character or a high logic character in the transmission signal;

a "1" character in the sensor signal is always coded as a high logic character or a low logic character in the transmission signal;

a "0" character following another "0" character in the sensor signal is coded as a ZERO character in the transmission signal, unless a preceding character in the transmission signal was already a ZERO character;

a "1" character following another "1" character in the sensor signal is coded as a ZERO character in the transmission signal, unless a preceding character in the transmission signal was already a ZERO character; and

coding is effected according to basic coding rules if a preceding character in the transmission signal was a ZERO character.

Claim 30 (new). The output unit according to claim 21, wherein the second character set for the sensor signal has at least two different characters and the first character set for the outgoing transmission signals TxA, TxB, the incoming receive signals RxA and RxB, and the signal to be emitted, has at least four different characters.

Claim 31 (new). The output unit according to claim 21, wherein the second character set for the sensor signal has at least two different characters and the first character set for the outgoing transmission signals TxA, TxB, the incoming receive signals RxA and RxB, and the signal to be emitted, has five different characters.

Claim 32 (new). The output unit according to claim 21, wherein an external short circuit in the transmission channel is detected at a latest after 40% of a signal time unit has elapsed.

Claim 33 (new). The output unit according to claim 21, wherein an external short circuit in the transmission channel is detected at a latest after 30%f of a signal time unit has elapsed.

Claim 34 (new). The output unit according to claim 21, wherein a detection of an external short circuit causes the characters of the first character set having a logic low or a logic high to be changed such that a character of the first character set about to be transmitted can be switched to a different polarity at a point between 40% and 60% of a signal time unit has elapsed.

Claim 35 (new). The output unit according to claim 21, wherein a detection of an external short circuit causes the characters of the first character set having a logic low or a logic high to be changed such that a character of the first character set about to be transmitted can be switched to a different polarity at a point after 50% of the signal time unit has elapsed.

Claim 36 (new). A receiving unit for receiving a signal to be received from a transmission channel having a first bus line and a second bus line of a motor vehicle, the receiving unit comprising:

a decoding unit for converting incoming receive signals into an operating signal;

at least two high-speed driver modules connected antiparallel to one another and upstream from said decoding unit, said driver modules connecting said receiver unit to the transmission channel and converting the signal to be received into the incoming receive signals;

a detection unit permitting detection of timing pulse edges of the incoming receive signals, said detection unit connected to said decoding unit;

said decoding unit operating under and programmed with a first decoding rule for a normal operating mode when synchronism of the timing pulse edges is detected by said detection unit for a signal time unit;

said decoding unit operating under and programmed with a second decoding rule for

a special operating mode when asynchronism of the timing pulse edges is detected by said detection unit for the signal time unit; and

the first and second decoding rules for the operating signal provide a first character set of n characters if a second character set for the incoming receive signals have at least n+1 characters.

Claim 37 (new). The receiver unit according to claim 36, wherein each of the characters of the first and second character sets is represented by a discrete, electrical signal state.

Claim 38 (new). The receiver unit according to claim 36, wherein the first character set for the operating signal has at least two different characters and the second character set for the incoming receive signals and the signal to be received has at least three different characters.

Claim 39 (new). The receiver unit according to claim 36, wherein the first character set for the operating signal has at least two different characters and the second character set for the incoming receive signals and the signal to be received has at least four different characters.

Claim 40 (new). The receiver unit according to claim 36, wherein the first character set for the operating signal has at least two different characters and the second character set for the incoming receive signals and the signal to be received has five different characters.

Claim 41 (new). The receiver unit according to claim 36, wherein if a time between two occurring timing pulse edges is less than 0.6 to 0.9 of the signal time unit or is greater than 1.1 times to 1.4 times the signal time unit, a character about to be decoded is interpreted as under a condition of an external short circuit.

Claim 42 (new). The receiver unit according to claim 36, wherein if a time between

two occurring timing pulse edges is less than 0.75 of the signal time unit or is greater than 1.25 times the signal time unit, a character about to be decoded is interpreted as under a condition of an external short circuit.

Claim 43 (new). The receiver unit according to claim 36, wherein the second decoding rule is formed such that:

in an event of an external short-circuiting of the second bus line to ground, a converted high logic character with time condition is decoded into a low logic character;

in the event of the external short-circuiting of the second bus line to a vehicle battery, a converted low logic character with time condition is decoded into a high logic character;

in the event of the external short-circuiting of the first bus line to the ground, a converted low logic character with time condition is decoded into a high logic character;

in the event of the external short-circuiting of the first bus line to the vehicle battery, a converted high logic character with time condition is decoded into a low logic character; and

a recessive ZERO character is decoded as a ZERO character in each of the aforementioned short-circuit cases.

Claim 44 (new). The receiver unit according to claim 36, wherein at least the first decoding rule provides, for the signal time unit of the incoming receive signals and of the signal to be received, a signal time unit with a same duration as the operating signal.

Claim 45 (new). The receiver unit according to claim 36, wherein the first decoding

rule is formed such that:

a low logic character in the incoming receive signals is always decoded into a "0" character or a "1" character in the operating signal;

a high logic character in the incoming receive signals is always decoded into a "1" character or a "0" character in the operating signal; and

the character in the operating signal, that is recovered from a ZERO character in the incoming receive signals, is identical to the preceding character of the operating signal.

Claim 46 (new). The receiver unit according to claim 36, further comprising a unit for recovering a clock signal from the incoming receive signals, said unit for recovering the clock signal connected to said decoding unit.

Claim 47 (new). A system for transmitting data in a motor vehicle via a transmission channel having at least two bus lines, the system comprising:

an output unit containing:

a fault-tolerant coding unit for receiving and converting a sensor signal into outgoing transmission signals TxA and TxB;

at least two high-speed driver modules connected antiparallel to one another and downstream from said coding unit for connecting the output unit to the transmission channel and for converting the outgoing transmission signals TxA and TxB into the signal to be emitted;

a comparison unit performing a voltage comparison of the outgoing transmission signals TxA and TxB with incoming receive signals RxA and RxB, said comparison unit connected to said coding unit;

said coding unit operating under and programmed with a first coding rule for a normal operating mode if equivalence between voltages of TxA and RxA and/or of TxB and RxB is detected by said comparison unit;

said coding unit operating under and programmed with a second coding rule for a special operating mode in an event of inequivalence being detected by said comparison unit between the voltages of TxA and RxA and/or of TxB and RxB, and therefore in an event of one of the bus lines being externally short-circuited to ground or to a vehicle battery;

the first and second coding rules for the outgoing transmission signals TxA and TxB provide a first character set of at least n+1 characters if a second character set for the sensor signal has n characters; and

a receiver unit containing:

a decoding unit for converting the incoming receive signals RxA and RxB into an operating signal;

said driver modules connecting said receiver unit to the transmission channel and converting the signal to be received into the incoming receive signals RxA and RxB;

a detection unit permitting detection of timing pulse edges from the incoming receive signals RxA and RxB, said detection unit connected to said decoding unit;

said decoding unit operating under and programmed with the first decoding rule for the normal operating mode when synchronism of the timing pulse edges is detected by said detection unit for a signal time unit;

said decoding unit operating under and programmed with the second decoding rule for the special operating mode when asynchronism of the timing pulse edges is detected by said detection unit for the signal time unit;

the first and second decoding rules for the operating signal provide the second character set of n characters if the first character set for the incoming receive signals RxA and RxB have at least n+1 characters.

Claim 48 (new). A method for transmitting data in a motor vehicle, which comprises the steps of:

coding a sensor signal using the output unit according to claim 21 into a signal to be transmitted; and

transmitting the signal to be transmitted to a receiver unit resulting in a received signal.

Claim 49 (new). The method according to claim 39, which further comprises decoding the received signal into an operating signal by the receiver unit according to claim 36.